

ABSTRACT

The present invention provides biocompatible vesicles comprising semi-permeable, thin-walled encapsulating membranes which are formed in an aqueous solution, and which comprise one or more synthetic super-amphiphilic molecules. When at least one super-amphiphile molecule is a block copolymer, the resulting synthetic vesicle is termed a "polymersome." The synthetic, reactive nature of the amphiphilic composition enables extensive, covalent cross-linking of the membrane, while maintaining semi-permeability. Cross-linking of the polymer building-block components provides mechanical control and long-term stability to the vesicle, thereby also providing a means of controlling the encapsulation or release of materials from the vesicle by modifying the composition of the membrane. Thus, the encapsulating membranes of the present invention are particularly suited for the reliable, durable and controlled transport, delivery and storage of materials.

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